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Notice of Allowability	Application No.	Applicant(s)	
	10/076,022	THOMSON ET AL.	
	Examiner	Art Unit	
	Khanh Tran	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed on 08/24/2006.
2. ☒ The allowed claim(s) is/are 6, 11-12, 18, 23-51, 54 and 59-63, which have been renumbered as set forth in the Office action respectively.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

1. The Amendment filed on 08/24/2006 has been entered. Claims 6, 11-12, 18, 23-51, 54 and 59-63 are pending in this Office action.

2. Claims have been renumbered as shown below, respectively:

claim 6 renumbered as claim 1;

claims 11-12 renumbered as claims 2-3;

claim 8 renumbered as claim 4;

claims 23-50 renumbered as claims 5-32;

claim 51 renumbered as claim 33;

claim 54 renumbered as claim 34;

claim 59 renumbered as claim 35; and

claims 60-63 renumbered as claims 36-39.

Response to Arguments

3. Applicant's arguments, see Applicant's Remarks on pages 22-25, filed on 08/24/2006, with respect to claims 6, 18, 54 and 59-63 have been fully considered and are persuasive. The rejection of claims 6, 18, 54 and 59-63 has been withdrawn.

4. Objection to claims 10 and 52 has been withdrawn after Applicant cancelled claims.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

5. Regarding claim 6, claim is allowable after Applicant correctly points out in the Remarks on pages 22-23 that Keevill et al. US Patent '938' does not teach or suggest "wherein generating the frequency domain representation of the second symbol includes sampling the second symbol early by a certain number of samples, further comprising: determining an expected slope based on the certain number of samples by which the second symbol is sampled early; and determining based on the slope and the expected slope a timing adjustment".

6. Regarding claim 11, claim 11 is allowable over prior art of record because the cited references, taken individually or in combination, cannot teach or suggest "producing, for each pilot in the second symbol whose magnitude is above a threshold, an associated total amount of rotation relative to a corresponding pilot in the at least one first symbol" and "producing for one of the pilots in the second symbol total amount of rotation based on the associated total amount of rotation of other pilots in the second symbol" and "determining a least squares fit based on the associated total amount of rotation for each pilot in the second symbol whose magnitude is above the threshold and the total amount of rotation based on the associated total amount of rotation of other pilots in the second symbol" and "generating, based on the least squares fit, the plurality of second correction factors".

7. Regarding claim 18, claim is allowable after Applicant correctly points out in the Remarks on pages 22-23 that Keevill et al. US Patent '938' does not teach or suggest "wherein generating the frequency domain representation of the first data symbol includes sampling the first data symbol early by a certain number of samples, further comprising: determining an expected slope based on the certain number of samples by which the first data symbol is sampled early".

8. Regarding claim 23, claim is allowable over prior art of record because the cited references, taken individually or in combination, cannot teach or suggest "producing, for each pilot in the first data symbol whose magnitude is above a threshold, an associated total amount of rotation relative to a corresponding pilot in the at least one training symbol" and "producing for one of the pilots in the first data symbol a total amount of rotation based on the associated total amount of rotation of other pilots in the first data symbol" and "determining a least squares fit based on the associated total amount of rotation for each pilot in the first data symbol whose magnitude is above the threshold and the total amount of rotation based on the associated total amount of rotation of other pilots in the first data symbol" and "generating, based on the least squares fit, the plurality of second correction factors".

9. Regarding claim 25, claim is allowable over prior art of record because the cited references, taken individually or in combination, cannot teach or suggest

"determining a number of clock cycles that the at least one training symbol is sampled early" and "generating first correction factors based on the number of clock cycles".

10. Regarding claim 28, claim is allowable over prior art of record because the cited references, taken individually or in combination, cannot teach or suggest "determining a number of clock cycles that the at least one training symbol is sampled early" and "generating first correction factors based on the number of clock cycles".

11. Regarding claim 32, claim is allowable over prior art of record because the cited references, taken individually or in combination, cannot teach or suggest "determining a number of clock cycles that the at least one training symbol is sampled early" and "generating first correction factors based on the number of clock cycles".

12. Regarding claim 36, claim is allowable over prior art of record because the cited references, taken individually or in combination, cannot teach or suggest "determining a number of clock cycles that the at least one training symbol is sampled early" and "generating first correction factors based on the number of clock cycles" and "producing, for each pilot in the first data symbol whose magnitude is above a threshold, an associated total amount of rotation relative to a corresponding pilot in the at least one training symbol and producing for one of the pilots in the first data symbol a total amount of rotation based on the associated total amount of rotation of other pilots in the first data symbol" and "determining a least squares fit based on the associated total

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amount of rotation for each pilot in the first data symbol whose magnitude is above the threshold and the total amount of rotation based on the associated total amount of rotation of other pilots in the first data symbol" and "generating, based on the least squares fit, the plurality of second correction factors".

13. Regarding claim 37, claim is allowable over cited prior art because the cited references cannot teach or suggest the claimed limitations "wherein tracking phase change includes determining for each pilot in the first data symbol an associated total amount of rotation relative to a corresponding pilot in the at least one training symbol, determining a least squares fit based on the associated total amount of rotation for each pilot, and generating, based on the least squares fit, the second correction factors".

14. Regarding claim 38, claim is allowable over cited prior art because the cited references cannot teach or suggest the claimed limitations "wherein tracking phase change includes determining for each pilot in the first data symbol an associated total amount of rotation relative to a corresponding pilot in the at least one training symbol, determining a least squares fit based on the associated total amount of rotation for each pilot, and generating, based on the least squares fit, the second correction factors, determining a slope and phase intercept based upon the least squares fit, and wherein generating, based on the least squares fit, includes generating the second correction factors based upon subcarrier numbers, the phase intercept, and the slope".

15. Regarding claims 39 and 51, claims 39 and 51 are allowable over the prior art of record because the cited references do not teach or suggest an apparatus for maintaining an accurate channel estimate comprising "an angle-to-converter that is to produce a plurality of first correction factors based upon the number of clock cycles" and "a first multiplier that is to adjust the frequency domain representation based upon the first correction factors to produce a reference channel estimate".

16. Regarding claim 54, claim is allowable after Applicant correctly points out in the Remarks on pages 22-23 that "wherein the first data symbol has a first data symbol frequency representation that is based on sampling the first data symbol early by a certain number of samples, and wherein the pilot phase tracking circuit determines an expected slope based on the certain number of samples by which the first data symbol is sampled early, and determines based on the slope and the expected slope a timing adjustment".

17. Claim 59 is allowable after being rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. Regarding claim 60, claim is allowable after Applicant correctly points out in the Remarks on pages 23-24 that Peeters US Patent '738' does not teach or suggest "determining a scaling factor based upon the reference power and the data symbol power; and scaling the reference channel estimate based upon the correction factors".

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19. Regarding claim 62, claim is allowable after Applicant correctly points out in the Remarks on pages 23-24 that Peeters US Patent '738' does not teach or suggest "a magnitude tracking circuit that is to calculate a reference power based upon pilots of the at least one training symbol and a data symbol power based upon pilots of a data symbol, and is to calculate a scaling factor based upon the reference power and the data symbol power; and a multiply unit that is to scale the reference channel estimate based upon the scaling factor".

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KCT

Khanh Cong Tran 11/10/
2006

Khanh Tran
Primary Examiner